

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A die apparatus for performing a flashless forging operation to manufacture a toothed portion of a steering rack, said rack having a longitudinal axis and said toothed portion comprising teeth, said die apparatus comprising:

first and second die members and first and second punch members, each having a forming surface shaped substantially as an obverse of a portion of said toothed portion, and

at least a portion of the forming surface of said first die member being shaped substantially as an obverse of ~~said teeth of said rack~~,

wherein said first and second die members are moveable towards each other along a first axis to a closed position thereby partially forging said toothed portion from a blank placed in said die apparatus and forming a substantially closed cavity defined by said forming surfaces,

said first and second punch members being disposed on opposite sides of said cavity, between said first and second die members, and said first and second punch members being adapted to move towards each other along a second axis substantially perpendicular to both of said first axis and said longitudinal axis, into said cavity, once said die members are in said closed position, thereby forging longitudinal indentations on either side of said toothed portion and completing said forging operation.

2-6. (Cancelled)

7. (Previously Presented) A die apparatus as claimed in claim 1 wherein said punch members are moveable by means of a mechanism operated by said die apparatus closing.

8. (Currently Amended) A die apparatus as claimed in claim 7 wherein said mechanism comprises at least one wedge member adapted to urge said punch members into said cavity, said wedge member having a wedge shape and being movable along an axis substantially parallel to said first axis.

9. (Previously Presented) A die apparatus as claimed in claim 1 wherein at least one of said die members is supported by a hydraulic cylinder pressurized by means of said die apparatus closing.

10. (Previously Presented) A die apparatus as claimed in claim 1 wherein a cross section of said toothed portion is substantially D-shaped.

11. (Original) A die apparatus as claimed in claim 1 wherein said blank is a solid bar.

12. (Original) A die apparatus as claimed in claim 1 wherein said blank is cylindrical.

13. (Original) A die apparatus as claimed in claim 1 wherein said blank is a hollow bar and said die apparatus further comprises a mandrel adapted to be inserted into said hollow bar prior to said forging operation.

14. (Original) A die apparatus as claimed in claim 1 wherein said die apparatus further comprises at least one axially moveable end punch.

15. (Original) A die apparatus as claimed in claim 14 wherein said end punch is adapted to upset an end of said blank.

16. (Withdrawn) A method of manufacturing a steering rack comprising performing a forging operation on a blank by means of a die apparatus as claimed in claim 1.

17. (Withdrawn) A method of manufacturing a steering rack as claimed in claim 16 wherein the teeth of said steering rack are forged to net shape by said forging operation.

18. (Withdrawn) A method of manufacturing a steering rack as claimed in claim 16 wherein the cross section of the toothed portion of said steering rack is substantially D-shaped.

19. (Withdrawn) A method of manufacturing a steering rack as claimed in claim 16 wherein said blank has a first cylindrical portion and a second cylindrical portion smaller in diameter than said first cylindrical portion, said second cylindrical portion being forged to form the toothed portion of said steering rack, the shaft of said steering rack comprising said first cylindrical portion.

20. (Withdrawn) A method of manufacturing a steering rack as claimed in claim 19 wherein said blank further comprises a third cylindrical portion, substantially equal in diameter to said first cylindrical portion, said second cylindrical portion being between said first and third cylindrical portions.

21. (Withdrawn) A method of manufacturing a steering rack as claimed in claim 16 wherein said blank is heated to a warm forging temperature prior to said forging operation.

22-25. (Cancelled)

26. (Withdrawn) A steering rack made by the method of claim 16 wherein the toothed portion of said steering rack has two opposed longitudinal indentations on either side thereof, said indentations being formed by said forging operation.

27. (Withdrawn) A steering rack comprising a toothed portion wherein said toothed portion has two opposed longitudinal indentations on either side thereof.

28. (Withdrawn) A steering rack as claimed in claim 27 wherein the cross section of said toothed portion is substantially D-shaped.

29. (Withdrawn) A steering rack as claimed in claim 27 wherein said toothed portion is manufactured by a forging process.

30. (Withdrawn) A steering rack as claimed in claim 29 wherein said indentations are formed during said forging process.

31. (Withdrawn) A steering rack as claimed in claim 29 wherein the teeth of said toothed portion are forged to net shape.

32. (Currently Amended) A die apparatus as claimed in claim 1 wherein said punch members are moveable by means of a mechanism operated by a motion of said die apparatus closing,

said mechanism comprising first and second wedge members adapted to urge said first and second punch members, respectively, into said cavity, said wedge member having a wedge shape and being movable along an axis substantially parallel to said first axis, and

at least one of said die members is supported by a hydraulic cylinder pressurized by means of said die apparatus closing.